

a top ring drive shaft coupled to said top ring;

a stationary member supporting said top ring drive shaft;

a bearing interposed between said top ring and said top ring drive shaft
for allowing said top ring to tilt upon changes in the inclination of said upper
surface of said turntable; and

a damper provided between said top ring drive shaft and said stationary
member supporting said top ring drive shaft to dampen said top ring drive shaft.

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27. A polishing apparatus for polishing a surface of a workpiece,

comprising:

a turntable with an abrasive cloth mounted on an upper surface thereof;

a top ring positioned above said turntable for supporting the workpiece to
be polished and pressing the workpiece against said abrasive cloth;

a top ring drive shaft coupled to a first actuating means for pressing said
top ring and coupled to second actuating means for rotating said top ring;

a bearing interposed between said top ring and said top ring drive shaft,
said bearing allowing said top ring to tilt upon changes in the inclination of said
upper surface of said turntable;

a torque transmitter comprising a plurality of torque transmitting members
provided at a substantially lower part of said top ring drive shaft and extending
radially outwardly, said torque transmitting members transmitting torque from
said top ring drive shaft to said top ring at locations spaced from said top ring
drive shaft while permitting said top ring to tilt relative to said top ring drive shaft;

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and

a damper provided between said top ring drive shaft and a stationary member for supporting said top ring drive shaft, to dampen said top ring drive shaft.

28. The polishing apparatus according to claim 26 or 27, wherein said top ring has a plurality of suction holes connected to a vacuum source for attracting the workpiece to a lower surface of said top ring under a vacuum developed by said vacuum source.

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29. The polishing apparatus according to claim 26 or 27 wherein said top ring has a porous plate having a number of pores connectable to a vacuum source for attracting said workpiece to a lower surface of said porous plate under a vacuum developed by said vacuum source.

30. A polishing apparatus for polishing a surface of a workpiece, comprising:

a turntable with an abrasive cloth mounted on an upper surface thereof;
a top ring positioned above said turntable for supporting the workpiece to be polished and pressing the workpiece against said abrasive cloth;
a top ring drive shaft coupled to a first actuating means for pressing said top ring and coupled to second actuating means for rotating said top ring;
a bearing interposed between said top ring and said top ring drive shaft

for allowing said top ring to tilt upon changes in the inclination of said upper surface of said turntable;

a torque transmitter for transmitting torque from said top ring drive shaft to said top ring while permitting said top ring to tilt relative to said top ring drive shaft, said torque transmitter comprising a plurality of torque transmitting members provided at a substantially lower part of said top ring drive shaft and extending radially outwardly, said torque transmitting members transmitting torque at locations spaced from said top ring drive shaft; and

a damper for damping said top ring drive shaft, said damper being provided between said top ring drive shaft and a stationary member for supporting said top ring drive shaft.

31. The polishing apparatus according to claim 30, wherein said damper comprises an o-ring interposed between a radial bearing for supporting said top ring drive shaft and said stationary member.

32. The polishing apparatus according to claim 30, wherein said damper comprises oil supplying means for supplying oil into a space defined between said top ring drive shaft and said stationary member.

33. The polishing apparatus according to claim 32, further comprising a radial bearing interposed between said stationary member and said top ring drive shaft, and wherein said space is defined between said radial bearing and said stationary member.

34. The polishing apparatus according to claim 22 or 30, further comprising a transferring device provided in the vicinity of said turntable for transferring said workpiece between said transferring device and said top ring, said transferring device including a holder for holding said workpiece, and a shock absorber for resiliently supporting said holder so that said workpiece is not subject to impact force during the transfer process.

35. A polishing apparatus for polishing a surface of a workpiece, comprising:

a turntable with an abrasive cloth mounted on an upper surface thereof;

a top ring positioned above said turntable for supporting the workpiece to be polished and pressing the workpiece against said abrasive cloth;

a top ring drive shaft coupled to a first actuating means for pressing said top ring and coupled to second actuating means for rotating said top ring;

a bearing interposed between said top ring and said top ring drive shaft for allowing said top ring to tilt upon changes in the inclination of said upper surface of said turntable; and

a pressure adjuster provided between said bearing and said top ring for adjusting a pressure distribution of a lower surface of said top ring, said pressure adjuster including an annular portion which contacts an upper surface of said top ring.

36. A polishing apparatus for polishing a surface of a workpiece,
comprising:

a turntable with an abrasive cloth mounted on an upper surface thereof;

a top ring positioned above said turntable for supporting the workpiece to be polished and pressing the workpiece against said abrasive cloth;

a top ring drive shaft coupled to a first actuating means for pressing said top ring and coupled to second actuating means for rotating said top ring;

a bearing interposed between said top ring and said top ring drive shaft, said bearing allowing said top ring to tilt upon changes in the inclination of said upper surface of said turntable;

a damper provided between said top ring drive shaft and a stationary member for supporting said top ring drive shaft, to dampen said top ring drive shaft; and

a pressure adjuster provided between said bearing and said top ring for adjusting a pressure distribution of a lower surface of said top ring, said pressure adjuster including an annular portion which contacts an upper surface of said top ring.

37. A polishing apparatus for polishing a surface of a workpiece,
comprising:

a turntable having an abrasive cloth at an upper surface thereof;

a top ring positioned above said turntable for supporting the workpiece to
be polished and pressing the workpiece against said abrasive cloth;

a top ring drive shaft coupled to said top ring;

a bearing for allowing said top ring to tilt upon changes in the inclination of
said upper surface of said turntable;

a plurality of biasing members rigidly attached to said top ring; and

a damper provided between said top ring drive shaft and a stationary
member for supporting said top ring drive shaft, to dampen said top ring drive
shaft.

38. A polishing apparatus for polishing a surface of a workpiece,
comprising:

a turntable having an abrasive cloth at an upper surface thereof;

a top ring positioned above said turntable for supporting the workpiece to
be polished and pressing the workpiece against said abrasive cloth;

a top ring drive shaft coupled to said top ring;

a bearing for allowing said top ring to tilt upon changes in the inclination of
said upper surface of said turntable; and

a pressure adjuster provided between said bearing and said top ring for

adjusting a pressure distribution of a lower surface of said top ring, said pressure adjuster including an annular portion which contacts an upper surface of said top ring.

39. A polishing apparatus for polishing a surface of a workpiece, comprising:

a turntable with an abrasive cloth mounted on an upper surface thereof;

a top ring for supporting the workpiece to be polished, said top ring having an upper top ring member connected to a lower top ring member, said lower top ring member having a plurality of suction holes therethrough connectable to a vacuum source, whereby the workpiece is attractable to a lower surface of said lower top ring member under a vacuum developed by said vacuum source;

a top ring drive shaft;

a bearing interposed between said top ring and said top ring drive shaft for allowing said top ring to tilt upon changes in the inclination of said upper surface of said turntable; and

a torque transmitter for transmitting torque from said top ring drive shaft to said upper top ring member while permitting said top ring to tilt relative to said top ring drive shaft.

40. A polishing apparatus for polishing a surface of a workpiece,
comprising:
a turntable with an abrasive cloth mounted on an upper surface thereof;
a top ring for supporting the workpiece to be polished, said top ring having
an upper top ring member connected to a lower top ring member, said lower top
ring member having a plurality of suction holes therethrough connectable to a
vacuum source, whereby the workpiece is attractable to a lower surface of said
lower top ring member under a vacuum developed by said vacuum source;
a top ring drive shaft;
a bearing interposed between said top ring and said top ring drive shaft
for allowing said top ring to tilt upon changes in the inclination of said upper
surface of said turntable; and
a plurality of biasing members rigidly attached to said top ring.

41. A polishing apparatus for polishing a surface of a workpiece,
comprising:
a turntable with an abrasive cloth mounted on an upper surface thereof;
a top ring for supporting the workpiece to be polished, said top ring having
an upper top ring member connected to a lower top ring member, said lower top
ring member having a plurality of suction holes therethrough connectable to a
vacuum source, whereby the workpiece is attractable to a lower surface of said
lower top ring member under a vacuum developed by said vacuum source;

a top ring drive shaft;

a bearing interposed between said top ring and said top ring drive shaft
for allowing said top ring to tilt upon changes in the inclination of said upper
surface of said turntable; and

a torque transmitter for transmitting torque from said top ring drive shaft to
said upper top ring member while permitting said top ring to tilt relative to said
top ring drive shaft.

wherein said upper top ring member includes an annular portion which
contacts an upper surface of said lower top ring member.

A 42. The polishing apparatus according to claim 39, 40, or 41, wherein
said top ring drive shaft and said upper top ring member have vacuum passages
therein connected to one another and connectable to said vacuum source, and
wherein said vacuum passage in said upper top ring member is connected to the
suction holes in said lower top ring member.

43. The polishing apparatus according to claim 42, wherein said upper
and lower top ring members are shaped and disposed so as to form a vacuum
manifold therebetween, each of said suction holes in said lower top ring member
and said vacuum passage in said upper top ring member opening into said
manifold.--